

ZOOLOGY.—*New genera and species of millipeds from the southern peninsula of Haiti.*<sup>1</sup> H. F. LOOMIS, U. S. Bureau of Plant Industry.

The western end of the southern peninsula of Haiti is an area from which no millipeds ever have been reported. Indeed, this might be said for the entire western half of the peninsula, with the single exception of the high mountain Morne La Hotte, from whose slopes Dr. P. J. Darlington, of the Museum of Comparative Zoology, collected 12 species of millipeds in 1934. Ten of these species proved to be new.<sup>2</sup>

It is only within the last two or three years that an all-weather road leading from Aux Cayes to Jeremie and thence to Anse d'Hainault has given ready access to the interior country hitherto reached only on horseback or afoot from the coastal towns. This road traverses areas having great scientific interest to naturalists, as they contain plants and animals not found elsewhere in Haiti, many of them probably undescribed. A 3-day visit through this country by automobile in the summer of 1940 afforded the writer several opportunities incidental to the object of the trip, to search the humus layer for members of the diplopod fauna. These brief stops, however, resulted in a collection of nine species of millipeds, four of which were new to science, three representing undescribed genera. Two of these genera are of families not previously known from Haiti; in fact, one of them has not before been found in the West Indies, its closest relatives being in California. A new species of *Rhinocricus*, of large size and handsome coloring, was called to my attention by T. A. Fennell, Agricultural Adviser to Haiti, who saw it several weeks prior to the writer's visit while in company with Andre Audant, of the Haitian Department of Agriculture, who warned that the animal had the startling ability of projecting its caustic repugnatorial fluid far from the body and hence was a dangerous creature to handle. In addition to these new forms, a fifth species, previously described, is recorded from Haiti for the first time.

The type specimens of the new species here described are deposited in the U. S. National Museum. Paratype specimens are in the Museum of Comparative Zoology, Cambridge, Mass.

#### Family SIPHONOPHORIDAE

##### *Siphonophora* sp.

Five or six females, not definitely assignable to species from between Chambellan and Dame Marie, August 1, 1940.

<sup>1</sup> Received February 24, 1941.

<sup>2</sup> Bull. Mus. Comp. Zool. 80 (1). 1936.

## Family STEMMIULIDAE

*Prostemmiulus* sp.

A female, the species not identifiable, from between Chambellan and Dame Marie, August 1, 1940.

## Family CAMBALOPSIDAE

*Cambalomma*, n. gen.

*Type*.—*Cambalomma laevis*, n. sp.

*Diagnosis*.—The smooth, *Spirostreptus*-like body has the surface of the segments continuous instead of divided into two parts by a transverse constriction; hence, the segments more nearly resemble those of the order Anocheta, but in this respect *Cambalomma* is no more anomalous in the present family than is the genus *Choctella* Chamberlin in the Cambalidae. In other characters *Cambalomma* falls readily into the Cambalopsidae.

*Description*.—Body of moderate size and rather slender, from 15 to 17 times as long as broad and scarcely constricted behind the first segment; without longitudinal crests or swellings; surface finely shagreened, dully shining.

Head with eyes very well developed and widely separated, composed of numerous ocelli in four series; vertex faintly sulcate at middle; clypeus with two setiferous punctures on each side; labrum with about nine setiferous punctures on each side; antennae slenderly clavate, with a sensory patch of tiny setae at the outer distal end of joints 5 and 6; gnathochilarium with the mentum constricted above the basal half but not transversely divided.

First segment with the sides broadly rounded and clasping the sides of the body; a raised rim proceeding from behind the eye around the lateral limits to the posterior margin.

Ensuing segments with surface continuous, unbroken by a transverse sulcus or constriction dividing each segment into two parts as in other genera; the anterior portion of each segment, that usually covered by the preceding segment, with tiny, fine, undulating, transverse striae; remainder of segment very finely roughened and dully shining; ventral striae pronounced, extending over the posterior half of each segment less than halfway to the pores on the anterior segments and even more restricted on the segments thereafter; pores easily seen, beginning on segment 5 and apparently ending on the antepenultimate segment as no pore is visible on the somewhat telescoped penultimate segment.

Last segment only slightly produced, much exceeded by the inflated anal valves, which meet in a deep groove; preanal scale a narrow ellipse with a pad process at each side projecting from under the margin of the last segment.

Gonopods relatively simple, somewhat resembling those of the genus *Epinannolene* but possibly not fully developed as the last two segments of the largest and oldest male (type) are legless, indicating that the animal lacks one molt of maturity.

First pair of male legs 5-jointed, the coxae with a long process at the base of each on the posterior side, the process projecting downward into a special excavation of the sternum; other male legs normal.

*Cambalomma laevis*, n. sp.

One male (type) with 61 segments, the last two of which are legless, and five immature females from Jeremie; one mature female from between Chambellan and Dame Marie, August 1, 1940.

*Description.*—Length of mature female 60 mm, diameter 4 mm; number of segments 62; body very slightly constricted at segments 3 and 4, thereafter with the sides parallel to the posterior fourth from which it narrows gradually; surface of body dully shining but with the head, first segment and the anal segment more brilliantly shining.

Head with antennae slenderly clavate (Fig. 1); joints 2 and 3 thinner and slightly longer than the others, joints 5 and 6 widest and each with a sensory spot of setae at the distal end on the outer side; eyes elongate oval, separated from each other by about twice their longest diameter, composed of 28 to 30 ocelli in four rows with the longest row behind, the rows containing ocelli as follows: 9, 8, 6, 5 or 8, 9, 7, 6; gnathochilarium as shown in Fig. 2.

First segment broadly and evenly rounded on the sides (Fig. 3) and clasping the body; the raised rim extending from behind the eye to the posterior margin, sometimes with two or three tiny rudimentary striae inside it below.

Ensuing segments as described for the genus.

Last segment not much produced, the apex broadly rounded and much exceeded by the inflated and brilliantly shining anal valves, which meet in a deep groove.

Legs with the sterna finely roughened like the dorsal surface of the segments and without striae.

Gonopods as shown in Figs. 4 and 5.

Seventh segment of the male deeply emarginate in front ventrally to receive the tips of the gonopods, the surface behind the emargination specially elevated.

First pair of male legs as shown in Figs. 6 and 7.

#### Family SPIROBOLIDAE

##### *Rhinocricus modestior* Chamberlin

Two specimens from between Camp Perrin and Rivière Glace, July 31, 1940. Other specimens from between Chambellan and Dame Marie, August 1, 1940.

##### *Rhinocricus latespargor*, n. sp.

One male (type) and four females from between Camp Perrin and Rivière Glace, July 31, 1940. Collected by T. A. Fennell and H. F. Loomis but first seen several weeks previously by T. A. Fennell.

*Diagnosis.*—This species may be recognized instantly by its size and striking black and yellow coloration, a combination found in no other West Indian member of the genus.

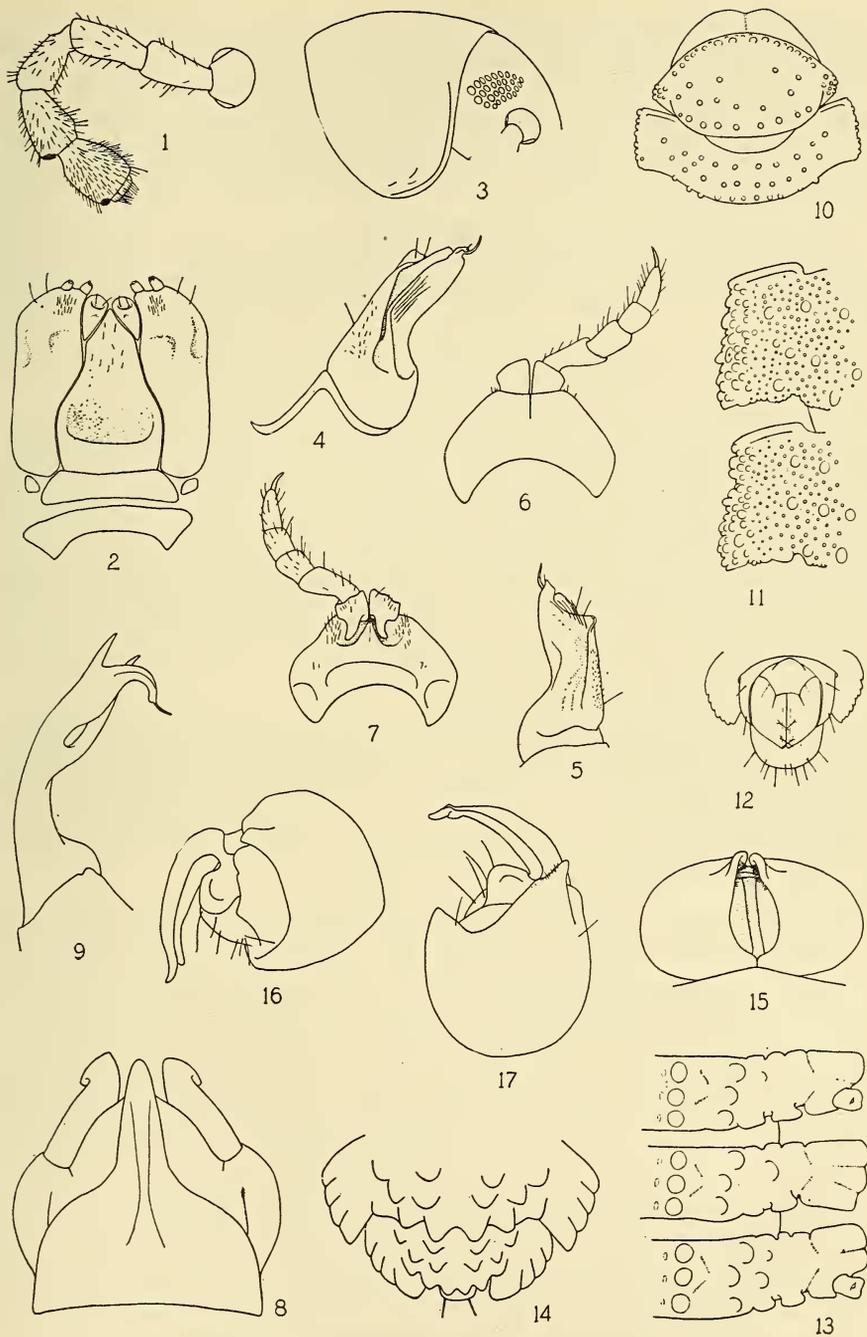
*Description.*—Length of the type 145 mm, width 11.5 mm, females to 159 mm long and 14 mm wide; number of segments 53 to 55; color of living ani-

Figs. 1-7.—*Cambalomma laevis*, n. sp.: 1, Antenna; 2, gnathochilarium; 3, first segment and part of head, lateral view; 4, right gonopod with median plate, anterior view; 5, right gonopod, posterior view; 6, first leg and sternal plate of male, anterior view; 7, first leg and sternal plate of male, posterior view.

Figs. 8, 9.—*Rhinocricus latespargor*, n. sp.: 8, Gonopods, anterior view; 9, inner gonopod, anterior view.

Figs. 10-12.—*Proaspis aitia*, n. sp. 10, Head and first two segments, dorsal view; 11, lateral carinae of segments 10 and 11, dorsal view; 12, segments 19 and 20, anal valves and preanal scale, ventral view.

Figs. 13-17.—*Fennellia ovipes*, n. sp.: 13, Right hand half of segments 5, 6, and 7, oblique lateral view; 14, segments 18, 19, and 20, dorsal view; 15, gonopods in normal position inclosing inner joints; 16, right hand gonopod extended, vertical ventral view; 17, gonopod extended, oblique outer view.



Figs. 1-17.—(See opposite page for explanation.)

mals brilliant shining black with the narrow margin of each segment, the posterior third of the hindbelt, bright lemon-yellow; first segment completely surrounded by a narrow band of yellow; last segment yellow at apex.

Head with the median line moderately impressed on the vertex, very deeply impressed on the clypeus immediately above the center tooth of the labrum; transverse lines of the frontal area faintly impressed; margin of head below the eye with a broadly raised rim; antennae with numerous sense cones; joint 2 longest; eyes composed of 33 to 41 ocelli in six, rarely seven, rows paralleling the margin of the first segment.

First segment with lateral limits sharply rounded, almost angular, the raised rim short and not well developed, beginning far below the eye and reaching to the back margin without following the curve of the lateral margin.

Second segment with a quite prominent shoulder below the limits of segment 1, its ventral surface slightly concave and coarsely striate.

Ensuing segments have the forebelt impressed with fine, short, undulating lines; midbelt very smooth and shining; hindbelt much the same but with a few tiny punctures; transverse sulcus indicated by a faintly impressed line only on the sides of the body; lateral sulcus also faintly impressed; pores quite large and placed as in *R. lethifer* Loomis; scobinae small, deep and close together, beginning on segment 10 and usually visible to segment 23.

Last segment with the tip slightly exceeding the anal valves, the apex finely punctate, at base more or less wrinkled transversely.

Anal valves much like those of *R. lethifer* but the punctations more scattered; preanal scale shorter and more elliptical than in that species, the apex more broadly rounded with the sides not emarginate.

Gonopods as shown in Figs. 8 and 9.

Seventh segment of the male with an elevated ventral crest directed somewhat backward and broadly but shallowly emarginate at the middle in front, the face of the emargination and the median part of the crest smooth, the crest striate elsewhere.

Anterior male legs with coxal modifications much like those of *R. lethifer*, the outer joints similarly without ventral pads.

*Remarks.*—As in the case of the larger *R. lethifer*, discovered in 1927 near the middle of the southern peninsula, this milliped also has the ability of ejecting its repugnatorial fluid far from the sides of the body and is, accordingly, to be classed as an animal dangerous to man as well as to smaller creatures that might incite it to discharge its poison toward them. Likewise, as with *R. lethifer*, this characteristic is recognized by the natives of the region for *R. latespargor* as Mr. Fennell, who first saw the millipeds and told me of them, was admonished by his Haitian companion to handle them with care as roughness might induce the discharge. Those collected on my visit were taken alive in a large humus-filled can to the house where we were to pass the night. There, on the cement floor of the porch, the animals were released and, as they began to walk away, were irritated with a long switch until the repugnatorial fluid was ejected, when the distance attained by it was measured and recorded. Several of the millipeds ejected the fluid distances up to 24 inches from each side of the body but the maximum effort was a double salvo, which sent the discharge 28 inches on one side and 33

inches on the other side of the animal! This same animal had twice, immediately before this maximum effort, ejected fluid distances under 24 inches from the body, although in both these instances less fluid had been used than in the third ejection. The fluid, greenish yellow in color, left the body so suddenly and in such short, fine jets that it scarcely could be seen until it fell on the cement floor in tiny droplets distributed somewhat fanwise far from the body.

#### *Azygobolus tumidus* Loomis

One mature male was found in a fruit cluster of the palm, *Borhoa crassipatha* (Martius), collected between Cavaillon and Aux Cayes, July 31, 1940. This is the first record of this milliped in Haiti.

#### Family PLATYRHACIDAE

Although this family is well represented in Central and South America only one species previously has been known in the West Indies, *Nanorrhacus luciae* (Pocock), from the island of St. Lucia. A Cuban species, which C. H. Bollman in 1888 included in this family under the name *Stenonia maculata*, has recently been shown to belong in the Chytodesmidae and was made the type of the genus *Schizodira*.<sup>3</sup> With the discovery in Haiti of a new species of platyrhacid having a combination of characters not found in other American forms the necessity arises of erecting a genus to receive it.

#### *Proaspis*, n. gen.

*Type*.—*Proaspis aitia*, n. sp.

*Diagnosis*.—Apparently differing from all other American members of the family in the peculiar construction of the preanal scale, which is elevated in front and projects forward a little, overlapping the posterior margin of segment 20, a condition to which the generic name alludes. In a combination of other characters *Proaspis* differs from previously known American genera also.

*Description*.—Body of intermediate size, approximately 40 mm long and less than one-sixth as wide; dorsum only moderately convex, with lateral carinae above the middle of the body and projecting a considerable distance away from it.

Head with median depression of the vertex rather wide and deep; labrum concave, smooth and shining in contrast to the granular surface elsewhere.

First segment wider than the head but narrower than the second segment; lenticular in outline; a series of large tubercles along the front and back margins, a few scattered ones in the median area and a small concentration at each lateral angle; surface between the large tubercles covered with small round granules.

Ensuing segments with three transverse rows of large tubercles, the remainder of the surface with numerous smaller tubercles or granules as on segment 1 but lacking any semblance of polygonal areas or impressed lines; lateral carinae with a prominent shoulder at base in front, the outer margin thickened, especially on the poriferous segments, and with numerous rounded or oliviform tubercles, some of which are almost as large as the tubercles of the dorsal rows; pores opening obliquely outward from the margin on all except the last few segments where they are more nearly dorsal; an-

<sup>3</sup> Psyche 48: 35-39. 1941.

terior subsegments densely beset with tiny elongate granules; segment 19 with the lateral carinae produced backward, the posterior limits almost acute; last segment much exceeding segment 19, the posterior margin broadly rounded; dorsal surface granular, lacking large tubercles but it and the margin with definitely placed setae.

Preanal scale slightly elevated in front and a little produced forward, covering the median portion of the ventral margin of segment 20.

Sterna without processes at the base of each leg; surface finely granular.

Segment 3 of the females with the ventral anterior margin emarginate on each side of the middle, the margin behind the excavations strongly raised and thickened, especially that between the two emarginations.

#### *Proaspis aitia*, n. sp.

Three females, one the type, collected from beneath loose grass at roadside between Camp Perrin and Rivière Glace, July 31, 1940.

*Description*.—Length 38 mm, width 6 mm; color dull yellowish white but with an incrustation of reddish-brown, claylike material almost obliterating the body color.

Head and first two segments as shown in Fig. 10; antennae resting in a slight depression laterad of the socket, the depression not sharply limited above or below; distance from each socket to the side of the head equivalent to the distance between the antennae.

Dorsum of segments moderately convex, the lateral carinae projecting almost horizontally from above the middle of the body, their shape and the sculpturing of the body as shown in Fig. 11; posterior end of the body narrowing gradually, beginning with segment 17.

Last segment much prolonged beyond segment 19 and with the posterior end very broadly rounded; dorsal surface granular but lacking large tubercles as on preceding segments, there are, however, two large subterminal dorsal setae with six similar setae projecting from the apical margin and from two to four small setae beneath the apex; below the apical projection and near the margin on each side are two large setae.

Preanal scale, anal valves, and the last two segments are shown in ventral view in Fig. 12.

#### Family CHYTODESMIDAE

##### *Docodesmus parvior* Chamberlin

A male collected at Jeremie and a female collected between Chambellan and Dame Marie, August 1, 1940.

#### Family STIODESMIDAE

##### *Fennellia*, n. gen.

*Type*.—*Fennellia ovipes*, n. sp.

*Diagnosis*.—With the same pore formula as *Psochodesmus* Cook but the body larger and definitely broader, having lateral carinae more extensive and obliquely descending nearly to the level of the legs instead of projecting almost horizontally high on the sides of the body.

*Description*.—Body with 20 segments, broad, in outline much as in *Docodesmus* Cook, only four or five times longer than its width and less than 10 mm long; the dorsum strongly arched with the lateral carinae descending at an oblique angle almost to the level of the sternal plates.

Head broad, extending far outward from the antennal sockets; vertex

scarcely elevated, strongly erose and granular, medianly channeled; frontal area transversely rugose; clypeal area smooth and shining.

First segment with the thin expanded front margin much as in *Docodesmus* but with 10 instead of 12 scalloped quadrate areas along it; surface with two transverse rows of large tubercles, six in the anterior row, four in the one behind, the surface elsewhere finely granular except the expanded margin, which is almost smooth.

Ensuing segments with four oblique, ascending, longitudinal rows of large tubercles, three tubercles in each row; laterad of each outer row from one to three slightly smaller tubercles usually are present; remainder of dorsal surface of segments dull but not definitely granular; under surface of body finely and evenly reticulated; posterior margin of segments with a prominent lobe at the base of each lateral carina; lateral carinae thin, obliquely descending to near the level of the sterna, the outer margin also oblique with the anterior corner lower than the posterior one; pores opening from large quadrangular processes on segments 5, 7, 9, 10, 12, 13, and 15; carinae of segments 2, 3, 4, 6, 8, 11, and 14 with three outer scallops; segments 16 to 19 inclusive with four outer scallops; segment 5 with a single scallop or lobe in front of the pore callus; other poriferous carinae with two scallops in front of the pore callus.

Last segment small but visible from above between the two short backwardly produced lobes of segment 19; preanal scale triangular.

Gonopods each with a very large hemispherical basal joint capable of wholly containing the outer joint, the two basal joints usually closely applied to each other mesially, almost completely hiding the terminal joints within.

Third segment of the female with a low crescentic ventral ridge behind the genital opening between segments 2 and 3.

This genus is named for T. A. Fennell, my friend and companion on the journey to the southern peninsula of Haiti.

#### *Fennellia ovipes*, n. sp.

Two males, one the type, and two females from Jeremie, August 1, 1940.

*Description*.—Body from 8.5 to 9 mm long and from 1.8 to 2 mm wide; color rather dark dull brown, the large pore calluses colorless in sharp contrast to the rest of the dorsal surface; head with the roughened vertex almost black, the remainder of the head, the antennae, legs, and ventral surfaces colorless.

Body arch high with lateral carinae obliquely descending a considerable distance from the sides of the body as shown in Fig. 13, which also shows the sculpturing of the dorsum and the margins of the segments as well as the shape and position of the pore calluses; posterior end of the body shown in Fig. 14; the last segment has two dorsal tubercles in front which are not visible in the figure, being hidden by the penultimate segment; preanal scale of moderate size, triangular; anal valves flattened, with an indefinite ridgelike swelling down the middle of each; margins rather thin but strongly elevated.

Gonopods as shown in Figs. 15, 16, and 17.

The females have the thin, flattened genital organs protruding from between the second and third segments and directed forward, almost covering the coxal joints of the second legs.